AVIATION

SEPTEMBER 4, 1922 Issued Weekly PRICE 10 CENTS

Lawrence Sperry after landing the Messenger on its new landing gear

VOLUME XIII
Number 10

Four Dollars a Year

SPECIAL FEATURES

SPERRY DROPS LANDING GEAR, ALIGHTS ON SKIDS
DESCRIPTION OF THE M.I.T. SAILPLANE
FOREST FIRE PATROL BY AIRPLANE
THE CURTISS SEAPLANE GLIDER

THE GARDNER, MOFFAT CO., INC.
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

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CONTENTS

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Wanted: An American Sailplane Trophy

THE great interest which the French and German sailplane competitions have elicited from the press as well as from the public are not likely to bear any fruit in this country until a suitable trophy is offered to stimulate American development in this novel field of endeavor.

The United States has to date put in competition the Gordon Bennett, Curtiss Marine Flying, Pulitzer and Collier Trophies, each of which has in its own sphere stimulated the spirit of contest more than any other single factor in aeronautics. It is now proper that an American citizen should now offer the premier prize for soaring flight. The Wrights were among the earliest of the successful gliding men and their record of ten minutes, made in 1911, remained unbeaten for some ten years.

It is therefore an opportune time for some public spirited citizen, interested in aviation, to offer a substantial trophy for the encouragement of sailplane development, and to make Orville Wright its custodian, with his and his brother Wilbur's names inscribed as the first winners of the trophy.

The Importance of the Detroit Contests

TO make the most of the development of aviation requires more than a mere faith in its future. Interest and perseverance may be due to faith alone, but enthusiasm and energy depend upon something more intangible, a spirit which is fully realized only in competition and play. A contest of the proper kind brings out this spirit in its best form.

It is not only the pilot who flies the machine, but the man who invests his money, the executive at his desk, the designer at the drafting board, the workman in the shop—all work better, and work together better, when a race is in prospect. For all have a part in the hoped for result; selfish aims are forgotten, the game is the big thing.

It is this scarcely measurable yet all pervading influence which gives the highest importance to a great aviation meet such as will be held in Detroit next month.

Deflation of Rigid Airships

MOST people seem to think that the so-called rigid airship should be capable of maintaining its form without special provision for external support, even when deflated of gas. That this is an unreasonable requirement can readily be appreciated by a comparison with large steamships.

An airship floats in the air just as a steamship floats in the water, and is subject to the same nice interplay of forces, to which the design must be accommodated. A properly designed ship for either air or water will safely resist all stresses to which it will be subjected in its floating condition. But when it is no longer floating, its whole balance of forces is changed.

A ship which weathers the roughest gale on the high seas may be broken in half by the mere condition of being stranded out of water. Likewise no airship ever built, rigid or non-rigid, can avoid collapse if *deflated* in the open; for, taking all gas out of an airship is equivalent to taking the steamship out of water. Of course, the latter is often done, but only in a prepared drydock with blocks supporting the hull at just the right points, the object being to simulate the arrangement of supporting forces which are natural to the floating condition.

In similar manner a large airship must be deflated in a prepared hangar with suitable supporting props and wires, arranged to approximate its floating condition. Under the circumstances, is it reasonable to expect anything different?

The Schneider Cup Race

NOW that the sixth Schneider Cup race has been run and won by the British entrant, thus preventing Italy from becoming the permanent holder of this famous trophy, it seems fitting to express the hope that the American seaplane industry will be represented at next year's race.

We have on several occasions urged such a course, pointing out in particular how the Italian seaplane manufacturers benefited from the fact that Italian pilots won the cup three times, though the first of these victories was contested on technical points. As a result Italian seaplanes, which are incidentally of undoubted excellence have invaded every market open to their enterprise until now there is hardly a second or third class navy in Europe and South America which is not equipped with Savoia or Macchi flying boats. The same remark applies in a lesser degree to commercial flying boat services.

Surely, this is a market which should appeal to American manufacturers. Results attained in international competition obviously have the greatest publicity value and for this reason the Schneider Cup races are an institution which deserve active participation by our manufacturers, in conjunction perhaps with the U. S. Navy.

The Why of "Sailplane"

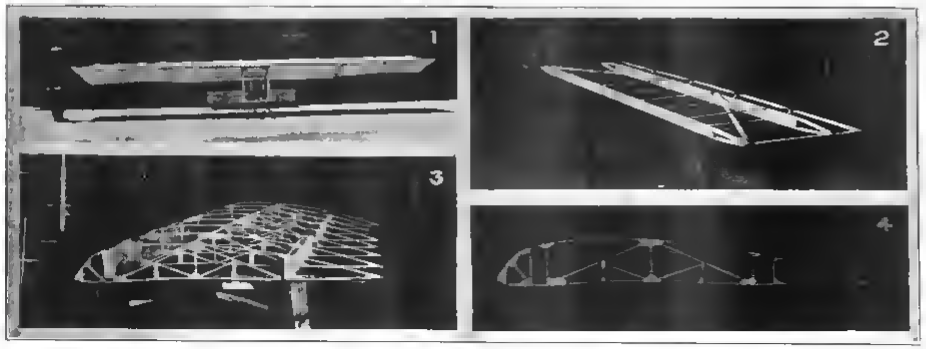
WITHOUT being particularly eager to coin new aeronautical terms, AVIATION believes that the new word "sailplane" is one which will justify its existence. An adaptation of the German *Segelflugzeug*, the word sailplane describes an aircraft capable of either gliding or soaring—a function which neither "glider" nor "soaring machine" adequately express. Hence its use seems warranted.

Description of the M.I.T. Sailplane

Product of Aeronautical Engineering Society Of M.I.T. Embodies Many Interesting Features

By Frank M. Gentry

Member Managing Board Aero. Eng. Soc. of Mass. Inst. of Tech.



The M.I.T. Glider No. 1 which successfully competed in the recent [illegible] meet. Fig. 1—[illegible] of glider, Fig. 2—stabilizer under construction. Fig. 3—construction [illegible] section. Fig. 4—[illegible] of the ribs.

The renewed interest in aerodonetics or the science of gliding and soaring flight has been somewhat phenomenal in its rise. After the sensational feat of Orville Wright at Kitty Hawk, N. C., in 1911 when he remained aloft 9 min. and 54 sec., being sustained only by the wind, the subject of motorless flight fell into the background until the passing of the World War. When the international and political circumstances permitted, however, the continental flying enthusiast were not slow to realize the possibilities of gliding and soaring as a sport. But the question of sport was not the only consideration, there were practical advantages to be gained as well. Winds and air movements in general are sources of energy, certain birds are able to convert this energy into useful work, to utilize the hidden power of the atmosphere in soaring, that is, in gaining altitude without the expenditure of bodily energy in wing flapping. Once the height has been gained and the wind puff has subsided, gliding can be resumed in the direction of travel. If, therefore, man could, with his artificial wings, imitate the soaring of birds, air travel could be made a more efficient mode of transportation through maneuvering to the best advantage in winds with the consequent saving of motor power.

But the problem was not so simple as the first glance indicated. Birds instinctively sensed the wind currents, their skill in manuevering was highly developed, and their wings were adapted to their use. Man, however, had yet but a simple knowledge of air movements, a skill yet to be acquired, and comparatively few wing sections suitable for soaring flight. The results of the recent foreign attempts at motorless flight are now well known. The time-mark of Wright has given way to the record of Hartb who on Sept. 5, 1921, flew for 22 min. without power other than he was able to derive from the movements of the air.

The climax of interest was reached with the construction of the M.I.T. soaring plane in this country by the Aeronautical Engineering Society of the Massachusetts Institute of Technology and especially when it was recently announced that its presence as the American representative at the French meet seemed assured. This machine is unique in many respects; it has profited by the experience of foreign countries, yet, no fear of criticism has stunted originality and departures from conventional lines.

After the questions of finance and man-hours had been successfully met by the society, a competition for designs was held. A committee of judges with Prof. E. P. Warner of the Department of Aeronautics acting as chairman, selected E. T. Allen and O. C. Koppen, co-designers, winners of the competition. Cost, ease of construction, strength, and maneuverability were factors of importance in the decision. After slight modification of the original plans, such as increasing the control surfaces and strengthening the landing device, actual construction was begun.

Cantilever Monoplane

The M.I.T. soaring machine is a cantilever monoplane. It has a wing spread of 24 ft. and an over-all length of 12 ft. It was designed with a factor of safety of six. The most important parts of the machine were submitted to actual laboratory test in the Testing Materials Laboratory of the Institute. For the most part it was found that the strength of the members exceeded that of the specifications. The completed machine weighs less than 73 lb. The chord is 4.75 ft. and the aspect ratio is five so that there are approximately 120 sq. ft. of supporting surface. If the pilot weighs in the neighborhood of 130 lb. this gives a flying load of 1.7 lb. per sq. ft. This is a slightly greater loading than is used on most of the foreign machines.

The wing section is a Munin No. 2 which seemed to give the most satisfactory results for the conditions of soaring flight. Variable wing sections were not considered because of the accompanying difficulties of construction. The ribs have a chord of 4.75 ft. and a maximum depth of 7.5 in. Each rib weighs 4.5 oz. and under actual test was found to withstand a distributed load of 196 lb. before crushing. The ribs are of special design and for the most part made from spruce. The joints are made of ply-wood which was glued and tacked. The strength of the ribs, considering their weight, is surprising. The end ribs are cut from ply-wood and have a maximum depth of 2.5 in.

Wing Construction

The wing is internally braced and is constructed in three detachable sections. The central section is 12 ft. long while each of the end sections is 6 ft. in length. These sections can be quickly assembled by means of eight bolts in four fittings. The wing spar fittings were formed from sheet steel. One of them withstood 5200 in. lb. on a testing machine before the test was abandoned due to breakage of the supporting frame. This result was satisfactory without completion of the test. There are two wing spars which are of box construction. They have a 0.75 in. spruce cap strip glued and screwed to sides made of three ply ply-wood. The spars are not exactly alike but are as deep as the wing section would allow. The spars of the central section are tapered horizontally while those of the end sections are tapered in the vertical direction. Each central wing spar weighs 8 lb. Light compression members are placed at the ends of the wing sections and diagonal guys of piano wire are provided. The ribs are held in position and braced by strips of cotton tape. The guys are provided with turnbuckles made from bicycle spokes. They proved to be light, strong, and suitable to the purpose. The wing is covered with a good quality of balloon cloth weighing 1.9 oz. per sq. yd. Two coats of a special light glider dope were applied to make the covering taut. The plane has no dihedral, consequently increasing the strength of the spars and lessening the difficulties of construction. The leading edge consists of a narrow spruce strip fastened in the front of the ribs. The trailing edge is merely a piano wire stretched between the ribs. The wing is fastened to the fuselage with four sheet steel fittings which in a laboratory test broke at 1,010 lb. The whole wing can be quickly detached and dissembled for transportation.

Details of Fuselage

The fuselage is rectangular at the front but slopes in to the rudder posts at the rear. It is constructed almost entirely of spruce except the front portion of the lower longerons which are made of ash. The other members near the front of the fuselage are also made of ash to lend greater strength near the pilot's seat and the landing gear. The fuselage joints are made of ply-wood wheb was glued and screwed in place. One of these joints withstood 560 lb. before breaking. Each fuselage truss is 10 ft. long by 20 in. high and weighs 4.5 lb. Light diagonal members made of spruce take the place of guys. This machine has no external wires except those connecting with the controls. The pilot's sent is beneath the wing. It is formed from ply-wood from which all superfluous material was cut.

A complete control system is provided. The ailerons extend the whole length of the end sections. They are 6 ft. long by 16 in. wide. They are manipulated by a bell-crank system. The horns are cut from ply-wood and are reinforced with metallic washers at the holes where the control wires are fastened. The stabilizer has a 7.5 ft. spread and a 1.75 ft. chord. It rests on the top longerons and is provided with a threaded rod so that the angle of incidence may be adjusted. The stabilizer weighs 3 lb. Each elevator has a spread of 3.75 ft. and a chord of 1 ft. The rudder is approximately 29 in. high by 19 in. long. A similar rudder was tested with sand. The horn which had just been freshly glued gave way under 11.5 lb. per sq. ft. Each elevator and the rudder are hinged with three hinges made from light sheet steel. A stick and rudder bar system is used.

The landing gear is extremely simple. The front landing device is composed of two skids made from taped laminated ash. They are fastened directly to the lower longeron. No provision is made for absorbing the landing shock other than the natural spring of the skids. The tail-skid, however, is equipped with a rubber shock absorber. It is also made of laminated ash.

A.C.C. Opposes Government Factories

At a recent meeting of the Aeronautical Chamber of Commerce the attention of the meeting was called to the fact that there appears to be an increasing tendency to place orders for manufacture of aeronautical equipment and supplies in shops owned and operated by the Government.

After a general discussion, in which various phases of this subject were considered, it was, upon motion duly made and seconded,

Resolved: That whereas the policy of the Government relative to the procurement of aeronautical equipment, as repeatedly emphasized by the Executive and Legislative Departments, as well as by the heads of the Air Services, is to do everything practicable to bring about the development of the civilian aircraft industry of the United States; and

Whereas, The Aeronautical Chamber of Commerce of America has noted and views with concern the growing tendency to manufacture airplanes and aeronautical equipment at flying fields, arsenals and navy yards, as evidenced by the large extent to which orders for procurement and reconstruction of equipment and supplies are being diverted from the civilian aircraft industry and placed with various agencies of the Government, and

Whereas; The force of the arguments that have been advanced in the press, on the floor of Congress and elsewhere, emphasizing the absolute necessity for the development of an aircraft industry, as the basis for all aviation in a national sense, are completely recognized and approved by all informed persons;

Now therefore be it resolved: That the Aeronautical Chamber of Commerce of America in order to support and uphold this generally accepted and clearly enunciated policy, declares that in its opinion all influences that may tend to the breaking down of this policy, are opposed to the public interest, and that all aircraft production work, suitable for the maintenance and development of the aircraft industry, should, whenever practicable, be placed in the hands of private contractors, in the U. S. in order that there may be built up in this country an industry adequate to the needs of a suitable Air Force, capable of meeting the need for defense, as well as for economic, social and industrial growth, in accordance with the clearly defined wish of Congress, as expressed and emphasized by that body at the time appropriations for the procurement of aircraft were made.

Two amendments to the By-Laws were submitted for consideration. After general discussion, the following resolutions were unanimously passed:

"*Resolved*: That Article IV of the By-Laws be amended to read:—Section 2. BOARD OF GOVERNORS—HOW ELECTED. The eight (8) Governors to be chosen from Class A Membership shall be elected by a majority vote of all the members of said class present either in person or by proxy at the organization meeting, and thereafter at the annual meeting. The five (5) Governors to be chosen from Class B membership shall be elected by a majority vote of all the members of said class, present either in person or by proxy at the organization meeting, and thereafter at the annual meeting. The two (2) Governors to be chosen from Class C membership shall be elected by a majority vote of all the members of said class present either in person or by proxy at the organization meeting and thereafter at the annual meeting. The Governors so elected shall constitute the Board for the ensuing year or until their successors are elected."

"OFFICERS. At the annual meeting of the Board of Governors in each year, hereinafter provided, the following officers shall be elected; President, First Vice-President, Second Vice-President, Third Vice-President, Secretary, Treasurer and General Manager, all of whom, except the Secretary shall be members of the Board of Governors. An Assistant Secretary, Assistant Treasurer and Assistant General Manager may also be elected or appointed. By virtue of their offices, the President, Treasurer and General Manager shall become members of the Executive Committee as hereinafter provided."

You will therefore note that the By-Laws are to be amended accordingly.

Forest Fire Patrol by Airplane and Radio

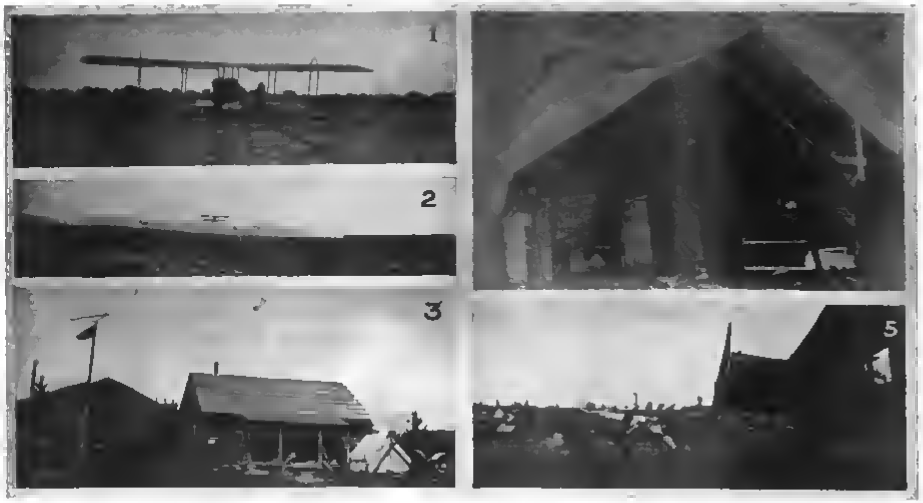
Eighty-Seven Radio Equipped Airplanes Now in Forest Fire Prevention Service

By S. R. Winters

Figuratively, the popularity of radio-telephony and radio-telegraphy is raging like a progressive forest-fire. Literally, the science of wireless is being employed to arrest the progress of the very thing it symbolizes, namely, woodland conflagrations of the West. Radio-telegraphy and aircraft have joined hands in a stubborn effort to lessen the $20,000,000 fire losses annually sustained in National forests—a shameful testimonial to the heedlessness of the cigarette-smoker, carelessness of the tourist-camper, and the unguarded locomotive-engines traversing Uncle Sam's wooded domain. Electrical storms, to be sure, are responsible for numerous outbreaks of fire but this is an unpreventable cause.

Forest rangers on foot, lookout towers, "smoke-chasers" following the course of railway trains on gasoline-propelled vehicles, and fire-detecting crews on packhorses, are among the various agencies employed by Uncle Sam in locating and suppressing destructive forest conflagrations. These methods have relative degrees of efficiency but are inadequate to cope with this task of magnitude by reason of the absence of dispatch in their application. Now, thanks to a cooperative arrangement between the Forest Service of the United States Department of Agriculture and the Air Service of the United States Army a hurry-up method of determining the presence of a fire and the quick dispatch of the fire-fighting crew has been put into practice. Aircraft, soaring above the dense woodlands that are frequently not easily penetrated by ground approach, is a prompt detection agency. A radio-telegraph transmitting apparatus as a fixture on the airplane renders possible a speedy report of the detection of a blaze to the headquarters of the forest-ranger where a wireless receiving outfit acknowledges the message from the air-going machine by dispatching a fire-fighting crew.

Congress has recognized the value of this joint fire-suppression agency by appropriating $50,000 in projection of the service during the current year. Montana, California, Oregon, Washington, Wyoming, and Idaho are the States in which the services of aircraft and radio are being unified in reducing the tolls yearly exacted of our lumber resources. The first feeble attempt to use a radio-telephone in a fire-reporting capacity was in the summer of 1919, but in the absence of an airplane the results were not gratifying. Reports to the Washington office of the Forest Service, which were made accessible to the writer, show a direct relationship between the dispatch of a fire-fighting crew to the scene of the blaze and its resultant levy on woodland resources. In other words, any system of detection is well-nigh valueless unless information of detection is speedily communicated to active suppression forces. Hence the happy wedlock of aircraft and the science of radio-telegraphy and radio-telephony in the capacity of guardian of our National forests.



Modern Forest Fire Prevention. 1—Lincoln Standard used for fire test flight over San Isabel National Forest, Colo., in 1920. 2—forest ranger leaving to search for a "set" fire somewhere on Greenhorn Range, Colo., 3—Summit Ranger Station House and aerial for wireless equipment, Oregon National Forest, 4—wireless set in operation, Selway National Forest, Idaho, 5—forest fire air patrol, aviation field, Portland, Ore.

Aircraft Patrols

The Air Service supplies aircraft for patrolling the dense woodland and the Forest Service provides officers and stations for the dissemination of information relating to the discovery of conflagrations a-borning. Twenty-nine patrols were organized for operation in 1921, each patrol consisting of three airplanes each, or an aggregation of 87 air-going machines, all told. The aircraft is equipped with radio-transmitting outfits and each camp or headquarters of the Forest Service constitutes a wireless receiving station. Each station is supposed to have a receiving range adequate to the reception of reports from aircraft from the remotest corners of each National forest.

The radio department of the Air Service at Mather Field, Sacramento, Calif., has been detailed to handle the wireless activities of the project. Operators, mechanics, and observers are trained in this school dedicated to the dissemination of the knowledge of the science of radio-telegraphy and radio-telephony. The instructions include information relating to the use of standard aircraft and ground-station radio equipment, methods of negotiating patrols, and how to dispatch their observations to headquarters. Map-reading, study of patrol routes, and air-service operation, are among the courses included in the curriculum, but instruction in the art of wireless is the major subject.

A radio-telegraph transmitting outfit designed by the Signal Corps of the United States Army, labelled as type S.C.R.-73, is employed on fire-detection aircraft. The equipment is of a damped-wave design, obtaining its power from a self-excited inductor type alternator. The latter is propelled by a constant speed air-fan or possibly a fixed wooden-blade air-fan designed for training purposes. The alternator, rotary spark gap, potential transformer, condenser, and oscillation transformer, are self-contained in the stream-line casing of the alternator. The latter is customarily mounted on the underside of the fuselage where the propeller spends its force in the form of an air stream. The only units included inside the fuselage are the telegraph sending keys, field and battery switch, dry battery in its holder, variometer, and antenna reel.

Transmitting Outfit

This type of transmitter conforms to the description of being a simple rotary gap, indirectly excited spark, provided with nine taps on the inductance coil of the closed oscillating circuit. Nine different wave-lengths are possible, and five varying toothed discs for the rotary spark gap yield five different signal tones. These two variations afford forty-five different combinations of wave-lengths and tones. Thus, it is feasible to press into service a series of airplanes for detecting forest fires in a restricted area without interference putting in its discordant work, which is likely under different circumstances. The wave-lengths and tones of this transmitting set are brought into harmonious operation when the airplane is on the ground. Once the machine leaves the earth, this apparatus is not available to either the pilot or observer. The only adjustment effected in the air is that accomplished by a variometer mounted in the fuselage which brings the open oscillating circuit into harmony with the closed circuit as indicated by the maximum energy reading on a hot wire ammeter in the variometer box. Simplicity is a bromidic term that fittingly describes the operation of this transmitting set—there being no battery to go "dead" or other auxiliary units failing to function. The hot wire ammeter reveals to the operator knowledge of whether or not his signals are being radiated.

A two-way radio-telephone set is employed on an airplane at each sub-base for directing the fire-fighting crew at big conflagrations. A Signal Corps design, bearing the number 68-A, is assigned to this purpose, the outfit having a wave-length range from 215 to 450 meters. A special constant voltage generator supplies the power for transmitting and for heating the essential vacuum tube filaments. Other accessory units of this radio-telephone outfit are: A filter box, radio set box, an interphone set box for affording communication between the pilot and observer, two head sets and telephone transmitters, with the necessary connecting cords.

Ground Installation

A damped wave airplane receiving set, known as Signal Corps design number 54, was installed on the ground at the forest supervisor's headquarters in each National forest. Here reports of detection of woodland blazes were received from airplanes making semi-daily patrols. This receiving outfit involves the use of both primary antenna and secondary circuits. These may be tuned by means of the variable capacitance and variable inductance found in both circuits. Across the secondary condenser is connected the detector and telephone circuit. A separate buzzer circuit is installed in the cover of the box to excite the set when adjusting the crystal detector.

An air-going machine assigned as a forest-fire patrol submits its radio equipment for thorough inspection before leaving the ground. In advance of its departure from the vicinity of the airdrome, the patrolling airplane is required to call the radio station and obtain its "O.K.," which signifies that both the radio-installation on the flying mechanism and ground wireless apparatus are functioning satisfactorily. The machine then soars along its well-defined route, sending back by wireless its observations according to pre-arranged time schedules. This knowledge from out of the air by the medium of ether is received both at the base of the Air Service and at the receiving headquarters of the Forest Service, over which the plane perchances to be flying at that particular time. With the arrival of the machine at another base, ordinarily for the purpose of the pilot and observer eating dinner, the list of observations is forthwith deposited with the wireless operator who transmits the reports by wireless to the main headquarters. This act serves as a verification of the report previously dispatched by radio from the machine while on its observation tour.

Seek to Prevent Interference

Not infrequently a forest-fire detecting station encounters interference from both atmospheric disturbances and annoyance from amateur radio operators nearby. To offset this undesirable tendency, Charles W. Rushead, radio engineer of the Air Service of the United States Army, invites mechanical ingenuity to devise a wireless set for this specific purpose. It should be compact in construction, two-way in operation, and employ a continuous wave. Such a design would not only lend itself to easy installation and transportation on aircraft but would limit the interference which is just now increasing with the astounding growth of amateur and commercial radio stations. Likewise, such a wireless equipment would enlarge the transmitting and receiving range of radio-equipped aircraft and render feasible the use of longer wave-lengths for this service.

Prophetic of the possibilities of radio communication as an instrumentality in arresting the progress of fires on Uncle Sam's reservations, is this commentary of R. B. Adams, telephone engineer of the Forest Service: "After my experience this summer my conclusions are that the wireless telephone will in the future play a very important part in our communication problems. They will not, however, be a substitute for permanent line construction except in certain instances. As a forerunner into outlying points of a permanent telephone line, they can be most successfully used. In many instances this remote territory can be continuously handled by wireless without the construction of a telephone line. To lookout points where the telephone lines are expensive to maintain wireless (if the distance is great enough) will prove more satisfactory than a telephone line both in cost and operation. Further experience in the use of wireless sets will demonstrate at a later date which of the Forest Service's 27,000 miles of telephone lines can be replaced by wireless."

Curtiss Develops Hydro Sailplane

New Type of Motorless Sail Plane Now Undergoing Tests

Glenn H. Curtiss seated in the cockpit of his hydro sailplane which he will shortly test at Great South Bay, Long Island

Glenn H Curtiss has completed construction of a hiplane flying boat glider which it was announced would be tested early in September on Great South Bay, Long Island. The hull is built of duralumin, wings and control surfaces of the usual wooden construction covered with silk, while the struts are of metal lining. The general design follows the lines of the NC4.

Eventually Mr. Curtiss hopes to rise from the surface of the sea, but in the first trials the glider will be launched from the deck of a speed boat or by towing. The machine was constructed at the plant of the Curtiss Aeroplane and Motor Corp., Garden City, Long Island.

Mr. Curtiss on Soaring

Mr. Curtiss in talking of his hopes for rapid development of gliding and soaring flight in this country, said:

"Our desire is ultimately to emulate the albatross—so to maneuver the motorless glider that it will take off from the surface of the sea. I believe it can be done. At first we shall try launching from the deck of a speed boat or by towing. Our glider is constructed of wood, duralumin and silk. Its dimensions are: Weight (empty), 150 pounds, loaded (one man), 310 pounds, span, 28 feet; chord, 60 inches; gap, 54 inches. Length over all, 22 feet 11 inches; wing area, 267.5 square feet; hull, 13 feet 2¼ inches long, 30-inch beam. The hull is made of duralumin. The glider is designed to fly at twenty miles an hour.

"General Patrick and Admiral Moffett, of the army and navy air services respectively, are watching these experiments with a view to military application.

"The astounding success of the German Hentzen in remaining aloft in a motorless airplane for two hours and ten seconds opens the door to a new phase in aeronautical development.

"Out of gliding and soaring flight we can learn how to build lighter, more efficient airplanes, and, having built them to utilize natural air currents to the consequent saving of artificial motive power. The wind tunnel, in which scale models of airplanes are tested, performs admirable service, but nothing can equal practical, full-size trials.

"We are now at a stage in aeronautics in which the buzzard and the albatross appear prominently. The buzzard is a magnificent soarer. In flat country, where the buzzard is most frequently found, air rises from the surface of the earth in waves and sometimes in spirals. Frequently I have watched a buzzard, with marvelous instinct, seek and find "lodgment" in one of these spirals and thus be literally lifted out of sight.

"Over the water the albatross is king of the air. He is superior even to the buzzard. The buzzard is comparatively lightly loaded, sometimes only one-half pound to each square foot of wing surface. The albatross has a wing loading of more than three pounds a square foot.

"The German and French experiments have been confined to hilly areas. I believe that the greater field lies over the water. The albatross with little effort takes off from the crest of a wave and rides the winds for hours. If we can learn the secret of the albatross's instinct we too can soar at will over the surface of the sea.

"The Germans have very appropriately called their gliders "sail planes." In marine navigation we have developed many types of craft and methods of operation. In the air we have a broader opportunity. By lessening our speed and increasing our load we cheapen air transportation and make it more generally available. Air sailing in three dimensions is certain to be a great sport—especially over the water. It may be that "pedal planes" will supplement sailing for sport, but for practical commercial air transport we shall apply low powered engines to the sailplanes."

Sperry Drops Landing Gear, Lands on Skids

Demonstrates New Type Releasable Landing Gear by Successful Flights

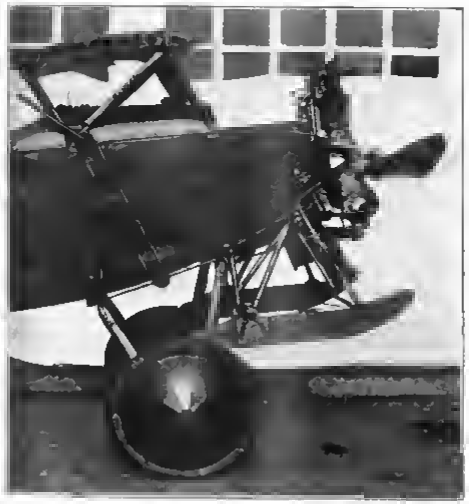
Lawrence Sperry has added to his other achievements, the inventions of a skid device so constructed that by simple mechanical means the whole landing gear of his airplane is released and dropped to the ground and a landing is made on skids. Mr. Sperry in a Messenger plane that has a usual run of 400 ft. has landed in one tenth of the distance.

The high speed of the Messenger, which is normally 99 m.p.h., was found to be 105 m.p.h. with the landing gear released.

The Trials

On August 21st, in the presence of Brigadier-General William Mitchell, Assistant Chief of Air Service, and Majors T. D. Milling and Walter Weaver, Commanding Officer Mitchel Field, a demonstration took place at the Sperry field, Farmingdale, L. I.

While in flight Mr. Sperry released the entire wheel and landing gear so that it fell clear of the airplane, thus relieving the craft of extra weight and interference. He then made a perfect landing bringing the machine to a dead stop 50 ft. from the place where the skid first struck the turf.



Close-up view of the Sperry Releasable Landing Gear with Auxiliary Skids

General Mitchell expressed himself as highly gratified with the outcome of the experiment.

The new landing gear was developed by Mr. Sperry at the suggestion of officers of the Army Air Service.

The object of dropping the landing gear is three-fold. First, dropping the landing gear gets rid of the weight and head resistance of the landing gear, thereby increasing the performance in climb and speed of the Plane.

Second, dropping the landing gear and landing on skids makes it possible to land in a much shorter space than hitherto.

Third, dropping the landing gear and landing on skids makes it possible to land on rough fields full of knolls and ditches, and also on water, without damage. (For the latter purpose, fuselage would be made water-tight). It can also be used to advantage for heavily loaded flying boats which can take off the ground or ice, drop the landing gear and continue to fly over the water.

To Obtain Superior Performance

Superior performance can be obtained by dropping the landing gear. However, this will apply more particularly to the high speed planes where the dropping of the landing gear will increase the flying speed some 10 m.p.h., depending upon the plane speed, at the same time getting rid of 90 or more pounds of weight.

The shorter distance of run with the skids is due to the friction between skids and the ground, whereby a run of one-quarter the usual distance is possible. This friction between the ground and skids is increased by the fact that the skids had been placed so that the machine presents a zero if not negative angle to the airflow. This means that at the beginning of the run there is no lift from the wings to detract from the friction of the skids and also no bouncing. The machine can be put on the ground at excess flying speed without bouncing. Landing on rough ground is made possible with skids because they have runners as in sleighs to bridge over ditches, thereby running more smoothly than with wheels.

The skids will permit landing on water, since the greatest obstacle to landing on water with the land machine is the landing wheels. The skids do not turn the machine over on its end on account of the fact that the center of gravity is so high above the wheels.

How the Gear is Operated

The accompanying picture furnished by the Lawrence Sperry Aircraft Co. shows the landing gear tested at the Sperry field, Farmingdale, L. I. by Mr. Sperry. The plane used for the experiments was a Messenger. Releasing the landing gear is done by pulling a hand lever on the right hand side of the fuselage, which operates a cam, ejecting the four posts of struts simultaneously, so that it is impossible for one strut to remain fast and joining the release. Close to the landing gear under the fuselage is a small stream line case containing a small parachute weighing five pounds. The parachute is attached to the top of the four landing gear struts, so that the first thing to strike the earth is the tires, which transmute the load to the shock absorbers.

During all of the experiments the same landing gear was used, without injury when dropping. The parachute could be used in a like manner over water, the buoyancy of the tires would support the gear and the white parachute would act as a mark, so that it could be found easily and pulled aboard ship.

The skids are so arranged that it is almost impossible to nose over in the roughest fields, which has been demonstrated by Mr. Lawrence Sperry landing on bumpy ground and running over a country road; this is due to the low center of gravity of the machine and the skids projecting so far forward.

The shock of landing is taken up by first landing on the rear end of the skids, which tends to stretch the front shock absorber rubber up to a point where the tail skid and landing slide are in line. Any additional shock is taken up by the shock absorber between the landing gear V struts. A nose on landing or hitting a hump is taken up by the front strut shock absorbers which are double acting.

When making a landing with the skids it is necessary to stop the propellar horizontally. This is done on the Messenger plane, which has a radial engine, by releasing the compression in two cylinders, and have the propeller so arranged that it will stop horizontally on the third cylinder.

Odyssey of the Sampaio Correia

The H16 flying boat Sampaio Correia, pilot Walter Hinton, which left New York at 7 10 a. m. Aug 17 bound for Rio de Janeiro, Brazil, came to grief on Aug 22, off Cape Maisi, Cuba, 38 miles from the United States naval base at Guantanamo The boat had left Nassau, Bahamas, at 11 43 a. m heading for the Windward Passage and landed at 4.10 p m. at Sagua de Tanamo, Cuba, for oil Having replenished her tanks, the Sampaio Correia took off at 6 55 bound for Port-au-Prince, Haiti As the nearing darkness and misty weather, however, made land and sea look alike, the pilot decided to

Crew of the Sampaio Correia (Twin-Liberty Curtiss H16) just before leaving New York on August 17 for Rio de Janeiro, Brazil. L. to R. J Thomas Baltzell, Pathe News Cameraman, Walter Hinton, Pilot, Dr. E Pinto Martins, Assistant Pilot, George T. Bye, N Y. World Reporter, and John Wilhusen, Mechanic

land Guantanamo, instead of at Port-au-Prince Having sighted what he believed to be Windward Passage Light, but what actually was the masthead light of the U S S Denver he flattened out for a landing at 8 11 p m and owing to the error in judgment stalled the machine and pancaked her from a hundred feet into the sea The terrific impact ripped open the bottom of the flying boat and broke her tail Fortunately for the aerial Argonauts, none of the crew was injured, and the bow of the boat did not fill with water for some fifteen minutes which enabled them to attract the attention of the U S S Denver by waving a flash lamp At 8.20 the five men constituting the crew were safely on board the warship, but most of their baggage was lost or destroyed when the Sampaio Correia hit the water

The hulk of the flying boat did not sink however, and thanks to the splendid assistance rendered by the U S S. Denver and the Navy tug Montcalm, it was possible to salvage the Sampaio Correia by towing her to Guantanamo, Cuba. Although the hull, wings and tail are too badly damaged to permit of repair, it is hoped to salvage the engines and some of the equipment.

In the meantime, Acting Secretary of the Navy Roosevelt, correctly gaging the aeronautical and political importance of a flight from the United States to Brazil, instructed Rear Admiral Moffett, Chief of the Bureau of Aeronautics, to release a Navy seaplane of the H16 type to the hecklers of the South America flight Thus has now been done and an H16 is now being equipped at Pensacola Naval Air Station for the flight to Brazil. The original crew—Walter Hinton, pilot; Dr. E Pinto Martins, assistant pilot and navigator; John Wilshusen, mechanic, John T. Baltzell, motion picture photographer, and George T. Bye, reporter—has pledged itself to go on the new cruise.

As the crow flies, Cape Maisi on the eastern tip of Cuba, where the Sampaio Correia came to grief, is about 1500 miles from New York. To reach it the flying boat flew a total of 1696 miles, hugging the coast line of North America all the way to West Palm Beach, Fla., because of adverse weather Its flying time, or hours in the air, from the foot of West 82d Street to Maisi, was 27 hr 7 min.

Hopping off at West 82d Street the morning of Wednesday, Aug 16, it flew to the Rockaway Naval Air Station, whence on Thursday it departed for Manteo, N C It covered the 350 miles in 5 hr 16 min

Friday it started for Charleston, S. C., but only got as far as Southport, N C, because of heavy head winds Its log for the day was 225 miles in 2 hr 48 min

Saturday Pilot Hinton again nosed into a thirty-mile southwester and after a battle of 2 hr 14 min. came to anchor off Charleston, 125 miles from Southport.

Three jumps were made Sunday—Charleston to Titusville, Fla., 275 miles, where continuous bucking of the same old head winds forced a descent for oil; Titusville to Rockledge, 25 miles, where a nasty squall forced a landing in Indian River, and Rockledge to West Palm Beach, 100 miles The flying time for the 400 miles was 6 hr 19 min.

Monday they flew to Nassau, 160 miles, in 3 hr 24 min. And Tuesday they started on the eighth leg of the voyage—to Port-au-Prince, Haiti

They were but 175 miles from their destination when they smashed onto the waters of the Windward Passage.

Airport for Danville, Va.

Prospects appear bright for the establishment of a municipal landing field at Danville, Va., in the very near future, according to Messrs F. E. Young and Wm. Filmore, civilian aviators, who have started a movement for such a field in that city. Aviator Young states that he has been receiving many applications from land owners near Danville to have him consider their fields.

Bar Association Favors Air Code

Reports from Washington, that the American Bar Association, at its recent annual meeting in San Francisco had reported adversely to federal legislation governing aeronautics, have been denied by Col. W. Jefferson Davis, a member of the Aviation Committee of the American Bar Association. Colonel Davis is a member of the Legal Advisory Committee of the Aero Club of America, and is on his way to Europe to make a study of the laws of foreign countries governing aeronautics. Colonel Davis, in a statement, said:

"The Aviation Committee of the American Bar Association is cooperating with the Senate and the House Committees at Washington in the study of federal legislation

"Our Aviation Committee made several recommendations to the Bar Association, all of which were unanimously adopted. The most important recommendation was as follows: That until Congress has enacted legislation fostering and regulating Aeronautics, and until the Supreme Court has determined the extent of federal control over Aeronautics, no further consideration to be given to the question of a constitutional amendment to vest exclusive jurisdiction over Aeronautics in the Federal Government."

"There has been some opposition to the question of federal control of Aeronautics. However, practically all of the leading constitutional lawyers throughout the country, have now unanimously decided that there is no limitation on the part of the federal Government so far as control of Aeronautics is concerned. A federal bill, if passed, will become the charter for civil aviation, and will be the basis of control and sovereignty which the federal government can, and should properly exert over the air.

"Congress is faced with the immediate necessity of enacting federal legislation providing for uniform air laws. The only surprising thing is that this country, a pioneer in flying, should have been so long without vision in solving fundamental questions of jurisprudence for the control and regulation of flying.

"The American Bar Association at its recent annual meeting took a very definite step forward, and I hope that the elaborate program worked out after years of study on the part of the Aviation Committee of the Association, and other allied bodies, in conjunction with the House and Senate Committees, will be carried into effect at this session of Congress. Aviation is primarily a field over which the federal government should and must exercise jurisdiction."

Rate of Climb Indicator

In order to secure the maximum performance from his airplane it is essential for the pilot to know at all times the rate at which he is climbing or descending The Pioneer Rate of Climb Indicator, which supplies this information, makes it possible for him to climb a ship at the highest possible rate, or to descend as slowly as possible, without stalling.

The Rate of Climb Indicator is direct reading and accurate for all conditions. It is not necessary to make any corrections or allowances. To climb as fast as possible the control should be pulled in until the hand of the indicator will not go any higher There is a certain range in position of the control where no change will be noted in the indication By keeping the control as far forward as possible without decreasing the indicated climb, maximum climb will be assured without the possibility of stalling

Similarly for descending without power at the slowest possible rate, it will be found that there is a certain range of control position throughout which no change is noted in the reading of the Rate of Climb Indicator. In this case the control should be kept as far forward as possible without increasing the descent indication This assures a minimum loss of altitude without the possibility of stalling the plane.

The Pioneer Rate of Climb Indicator is substantially constructed and withstands without damage the severe vibrations frequently encountered It is completely self-contained, there being no connections or attachments of any kind. Its weight is but 1½ lb. The instrument is mounted on the instrument board with screws or bolts, the same as an Altimeter or Air Speed Indicator

Aeromarine's Successful Lake Service

From the inauguration of the service, July 17, to August 17, 624 passengers were carried by Aeromarine flying boats between Cleveland and Detroit, while 150 more made special flights. With a daily service of two planes each way 114 crossings of Lake Erie were made in the first month's operations.

What more travellers learn that the flying boat trip between Cleveland and Detroit normally consumes only ninety minutes, compared with a five hours train ride or an all night boat voyage there is every reason to believe that this excellent service will become increasingly successful.

There were no interruptions in the double daily schedule during this period. A considerable amount of freight was transported, including, for the first time in the history of commercial aviation, shipment of a Ford model T roadster in knocked down form.

On some of the flights the Boats were equipped with radio and the passengers were entertained by music, baseball scores, and the regular broadcasting program

Forty nine per cent of the passengers carried were women and children. The oldest man to take the flight was a former sea captain, 82 years old When he arrived in Cleveland from Detroit his only comment was that there was no thrill in Aeromarine flying.

The operating base and passenger station in Cleveland is at the foot of 9th street, opposite D & C Docks—in Detroit at Memorial Park and the River. At each terminal is a floating Aeromarine Airport, combining a passenger station and supply depot. Every possible convenience is at these Airports for passengers and ample facilities for the maintenance of 100 per cent performance of operations. A fast motor launch ferries the passengers to and form the Airport. The round-trip fare is $75 00—and one way $40 00 Each passenger is allowed to carry 30 lb. of personal luggage without extra charge

British Win Schneider Cup

The international race for the Schneider Maritime Aviation Cup, held Aug 12 at Naples, Italy, was won by the British entrant, H C Biard on a Supermarine "Sea Lion II" flying boat (450 hp Napier "Lion" engine), who covered the course of 200 nautical miles in 1 hr 34 min 57⅗ sec., or at a speed of 126 6 knots (145 m p h.)

The three pilots of the Italian team finished second, third and fourth, respectively, in the following order

Second—Passalave on a Savoia S51 (300 hp. Itala) in 1 hr. 36 min. 54⅘ sec.

Third—Zanetti on a Savoia S19 (450 hp Ansaldu-San Giorgio) in 1 hr 44 min 7 sec.

Fourth—Corgoolino on a Savoia MVT (200 hp SPA) in 1 hr 51 min 27 sec.

The two French entrants, Vreman and Testa, both of whom were to fly Cams 36 flying boats (300 hp Hispano-Suiza), did not compete as owing to the Italian railroad strike their machines arrived too late to pass the elimination trials.

Hartford Aviation Meet

Armistice Day (Saturday, Nov. 11,) has been definitely selected for the 1922 Aviation Meet at the Municipal Airport of Hartford, Conn. Preliminary events will be scheduled for the afternoon of Friday, and all entrants will be invited to remain over and participate in the passenger carrying on Sunday. Program and arrangements are being formulated through co-operation between the local Aero Club and the Aviation Commission, and by the following committees:

Commissioner, Hiram Percy Maxim, general chairman; Commissioner James B. Slimmon, general secretary; Commissioner Edward J Daly, meet chairman; William G. Kingsley, traffic and grounds; Ian S MacKillop, supplies and purchases; Terry Morrison, flying; J Kelso Davis, program; Walter S. Schmtz, entertainment, M. T. Hazen, seaplanes; Christopher M. Gallup, publicity.

65 ENTRIES ASSURED!

THE GREATEST FLYING MEET IN HISTORY

NATIONAL AIRPLANE RACES

at DETROIT, MICHIGAN

OCTOBER 7th, and 12th, 13th and 14th, 1922

Endorsed by the Secretary of War and the Secretary of the Navy.
Sanctioned by all the Aeronautic Bodies.

THE UNITED STATES ARMY AIR SERVICE AND THE NAVY BUREAU OF AERONAUTICS HAVE CONFIRMED ENTRY OF MORE THAN FIFTY OF THEIR LATEST AND FASTEST PLANES.

PRINCIPAL EVENTS INCLUDE THE

CURTISS MARINE FLYING TROPHY RACE, OCTOBER 7th,

PULITZER TROPHY RACE, *(Speed Classic of the World)* OCTOBER 14th,

The Detroit News Aerial Mail Trophy Race for Large Capacity Multi-Motored Airplanes, October 12th.

The Aviation Country Club of Detroit Trophy Race for Light Commercial Airplanes, October 12th.

The Liberty Engine Builders' Trophy Race for 2-Passenger (Observation Type) Airplanes, October 13th.

New planes *New motors*

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WANTED! 1000 DELEGATES

THE SECOND NATIONAL AERO CONGRESS

at DETROIT, MICHIGAN

DURING THE NATIONAL AIRPLANE RACES

OCTOBER 12th, 13th, and 14th, 1922

One —Aviation is the new great arm of the national defense, and you as an American are vitally interested in developing this powerful weapon to defend your country and your home. The nation that commands the air shall control the surface on land and sea.

Two —The science of flight is your new medium of travel and transport. You must follow its progress if you are awake to the new era in communication.

Three—The greatest number of new and modern planes ever assembled at a flying event will give you first hand information about the remarkable development of aircraft.

Four —Representatives of the National Air Association, the Aero Club of America, and hundreds of prominent men are co-operating in the preliminary work of the Second National Aero Congress.

Five —The Second National Aero Congress is called to create an American aeronautic association which shall represent your thought and echo your voice here and abroad, in all fields of business and in the halls of your Municipal, State and National legislatures.

Six —You will have an active part in drafting the Constitution and By-Laws of this great representative organization. Your hand shall help write its policies, your efforts control its activities.

Seven—An Advance Committee on Organization is preparing an elaborate program for your consideration and approval.

Eight—Local committees are at work on details of the congress, to the end that your visit to Detroit may be replete with activities combining entertainment with convention business.

Nine —Reunions of flying squadrons are being held. Meet your buddies at the Second National Aero Congress.

Ten —Reduced railroad rates have been obtained. Your ticket agent can explain those details. Reservations can be arranged for you at Detroit's leading hotels where you will meet your co-workers and friends in aviation, and make acquaintances among the new arrivals in this constantly growing force, which believes, with Orville Wright, that "America, the birthplace of aviation, should lead the world in flight".

For further details write

The Advance Committee on Organization

SECOND NATIONAL AERO CONGRESS

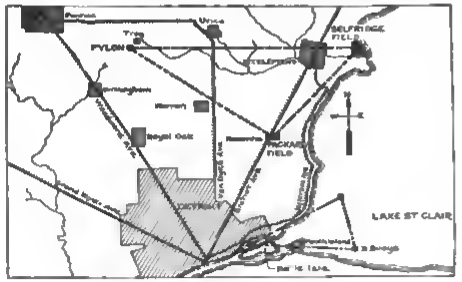
4612 Woodward Avenue, DETROIT, MICH.

307 Mills Building, WASHINGTON, D. C.

Pulitizer Race Course Over Water

For various reasons, principally because a joint committee of Army and Navy pilots felt it to be advisable from the standpoint of safety, the Executive Committee of the Detroit Aviation Society, Inc., announces changes in all courses for all races on which overland planes have been entered. This includes events nos. 2, 3, 4, and 5. The Curtiss Marine Trophy Race Course (event no. 1) remains as first announced.

For event no. 2, Detroit News Aerial Mail Trophy Race for large capacity multi-motored planes; event no. 3, Aviation Country Club of Detroit Trophy Race for light commercial planes, and event no. 4, Liberty Engine Builders' Trophy Race for observation type (2-passenger) machines. The course will start at Selfridge Field thence to Packard Field, from



Map showing land and water courses of the Detroit aviation events as originally scheduled. See text for changed course

there to Gaukler Point on Lake St. Clair, and thence back to Selfridge Field, completing the lap. The course will average approximately 24 miles to each lap.

After conferences with several pilots familiar with fast racing planes it was decided that greater safety would be obtained for both machines and pilots if the Pulitzer Race (event no. 5) is flown over water. The course has therefore been changed as follows:

Starting at Selfridge Field thence to Gaukler Point on Lake St. Clair and thence to a barge moored approximately 18 miles out on Lake St. Clair (in deep water) and thence back to Selfridge Field, making the lap forty miles, a triangular course of the same mileage as originally planned. Pylons are being erected at Selfridge Field and at Gaukler Point. A kite balloon will be anchored above the barge on the third point, making all three points of the course easily seen at all times.

For the purpose of encouraging civilian entries in the national airplane races to be held in Detroit, Mich. Oct. 7, 12, 13, and 14, 1922, the Detroit Aviation Society decided on Aug. 18 to extend the time limit for free entries until Sept. 1. Twenty-five per cent penalty entries close Sept. 8. Fifty per cent penalty entries close Sept. 15.

The entrance fee, $100.00, will be refunded if the contestant is in his allotted place ready to start in the contest, provided the entry was received before Sept. 1.

Entries received after Sept. 1, but prior to Sept. 8, will be penalized $25.00. Entries received after Sept. 8, but prior to Sept. 15, will be penalized $50.00. After Sept. 15 entries will be accepted only with the written consent of all other contestants and the entrance fee of $100.00 will not be refunded. Approximately fifty entries for the five principal events have been confirmed to date.

Detroit has declared a municipal holiday on Oct. 14, the date of the Pulitzer Trophy Race.

All individuals and organizations are invited to fly to the races, landing at Selfridge Field, Mt. Clemens, Mich.

$10,000 in cash prizes and $30,000 worth of gold and silver trophies will be awarded.

The United States Coast Guard, Internal Revenue Service, United States Navy and local court authorities have been asked to provide adequate patrol boats to keep the course clear of pleasure craft and to insure quick rescues if any of the contestants are forced down into the water.

The Curtiss Marine Trophy race on Oct. 7 will also be flown over Lake St. Clair, over a triangular course, one leg of which is over Canadian waters opposite Detroit.

The Canadian Air Board and other officials of the Dominion Government are invited to attend the race as guests of the Detroit Aviation Society and Aero Club of America.

On Oct. 12, 13 and 14, the second National Aero Congress will be held here for the principal purpose of creating a permanent national aeronautic association. The following are members of the national executive committee arranging for the Aero Congress: 1st District: Hon. James Hartness,

Map of the United States showing proposed Corps Area organization for the National Aeronautic Association

Springfield, Vt.; Godfrey L. Cabot, Cambridge, Mass. 2nd District: John B. Larkin, Buffalo, N. Y. 3rd District: Rear Admiral W. F. Fullam, U.S.N. Rtd., Washington, D. C. 4th District: James A. Meisner, Ensley, Ala. 5th District: B. M. Onteault, Cincinnati, Ohio; C. F. Kettering, Dayton, Ohio; Glenn L. Martin, Cleveland, Ohio. 6th District: Sidney D. Waldon, Detroit, Mich.; Bion J. Arnold, Chicago, Ill.; W. P. McCracken, Chicago, Ill.; Howard E. Coffin, Detroit, Mich. 7th District: John B. Coleman, Sioux City, Iowa, Ralph Crum, Davenport, Iowa.

Each of the above districts is holding its own convention to send delegates to the Aero Congress. Many air squadrons participating in the war are arranging for reunions at Detroit during the congress, among them the famous Ninety-Fourth Pursuit Squadron of which Capt. E. V. Richenbacker was commanding officer.

German Sailplane Up Three Hours

A new world's duration record for sailplanes was established on Aug. 24, the closing day of the third German soaring and gliding meet held in the Rhoen hills, when Pilot Hentzen, flying a Hanover sailplane, cruised about for 3 hr. 7 min. and landed some 1000 ft. above his starting point. Hentzen, who is a student of the Hanover Technical School which entered the Hanover sailplane, also established the previous world's record, on Aug. 14, with 2 hr. 10 sec. On this occasion he reached an altitude of 300 ft. above the summit of the Wasserkuppe, from which the soaring trials were made, and later rose to over 600 ft. height, which he maintained throughout his level flight, ceasing with a wind velocity of from seven to nine miles. Pilot Martens, using the same type of sailplane, had previously remained aloft 66 min.

The closing day of the Rhoen meet also witnessed other remarkable performances. Pilot Botsch, of Darmstadt, took off in squally weather below the Wasserkuppe and landed at its summit, which is about 3000 ft. above sealevel. Pilot Hackmann, also of Darmstadt, rose up to a height of about 1000 ft. and remained in the air 1½ hr., finally landing 1000 ft. above his starting point. Anthony Fokker, the airplane constructor, went for a short flight as a passenger in a sailplane, this being the first known record of such an event.

New Navy Training Plane

A new type of training plane for the training of student naval aviators which combines safety features, never before equalled in aircraft, with qualities of speed and maneuverability has just been delivered at the Naval Air Station, Anacostia, after a flight of seven hundred and sixty miles from Ogdensburg, N. Y. The plane was flown from Ogdensburg to Washington in 10 hr. flying time by Commander T. G. Ellyson, of the Bureau of Aeronautics, accompanied by G. B. Post, a representative of the builders.

The plane will be known as the Haff-Navy, HN1, and was built to Navy specifications by the Haff-Daland Company of Ogdensburg. Tests conducted at the factory and subsequent flights notably the one from New York have demonstrated excellent qualities of stability in the plane which renders it of exceptional value for training purposes.

A recent demonstration conducted by a Navy pilot under the supervision of naval inspectors showed that the HN plane was all but capable of flying without a pilot. A description of the test by Commander Ellyson is sufficient to give an accurate idea of the stability demonstrated by the plane. "In testing the plane for stability the pilot released the controls, taking his hands and feet off of them. The throttle was cut to low speed and the plane went into a long glide. He then speeded up the engine and still without the controls being touched the plane leveled off and continued in normal flight with the engine turning up from 1100 to 1200 revolutions and the plane making about 60 knots. Finally the engine was speeded up with the throttle wide open. The plane began to climb and in her doing so her speed was cut to about 40 knots. She fell off on one wing and dove until a speed of 100 knots was registered when the plane again leveled off in normal flight. During the entire demonstration, the pilot, Lieut. Neelson, did not touch the control with either his feet or his hands."

Confidence in the HN was evidenced by the builders of the craft when they requested permission of the Bureau of Aeronautics to deliver the plane by air to Anacostia at their own risk. This permission was given with the precaution of insuring the engine installation, which was the property of the Navy, against loss. The HN was piloted from Ogdensburg down the St. Lawrence to Montreal. From there a course across land to Lake Champlain and Lake George was followed. From Lake George an eighteen mile jump across land was made to Glens Falls on the Hudson and the Hudson River was followed to Keyport, N. J. The route then followed the Delaware River and Chesapeake Bay with interconnecting canals.

Just below West Point on the Hudson at Storm King Mountain a practical demonstration of stability was given which was not on the program. This point is beset by tricky wind conditions due to the topography of the country, and pilots are always on the lookout for trouble. The HN was swept through 90 degrees from her course and dropped 400 ft. but came out of the spill in beautiful shape and leveled off on her course. In many other types of airplanes the incident would have required a high degree of skill to avert a crash.

The HN is equipped with a Hispano-Suiza engine built by the Wright Aeronautical Corp. This is the engine which recently passed a record breaking test of 250 hr. duration on a Navy test stand in Washington.

Thomas Lands in Grand Canyon

Royal V. Thomas, a civilian aviator from Kansas, on Tuesday morning, Aug. 8, 1922, dropped over the rim of the Grand Canyon in an airplane and landed safely at the bottom—a mile below the surface of the earth. No other person has ever landed at the bottom of this subterranean mountain range in an airplane.

Mountains, canyons, cliffs, valleys, rocks and trees disturb the air currents almost exactly the same as water is affected when flowing over and around huge boulders, and cliffs. The air has its eddies, its whirlpools, up-currents and down-currents. It has its airfalls closely resembling waterfalls.

Start of the Gordon Bennett Balloon Race from Zurich, Switzerland, August 6. Official decision as to the winner had not been made at time of going to press, although it appears that Capt. H. E. Honeywell of the American Team will secure either first or second place, depending upon whether or not Capt. E. Demuyter, of the Belgian Team, is disqualified.

For instance, in flying his plane from Lincoln, Neb., to New Mexico and Arizona recently, Thomas got off his course just out of Trinidad, Colo., flying back up into the Rockies about thirty or forty miles before discovering his mistake. In crossing a point intersected by two large valleys he struck a down-current of air which dropped the plane from an altitude of 12,000 ft. to 8000 ft. in something less than a minute.

Thomas, an ex-army aviator, was at one time connected with the Lincoln Standard Aircraft company and gave Lincoln people many thrills at South field.

It was upon one of the plateaux that Thomas landed in his Thomas special airplane. Leaving his plane at Williams, Ariz., he went by train to the canyon to inspect the valley for a possible landing place. Arrived at the canyon he joined a party of tourists going down, on donkeys, and went with them as far as Indian Gardens, down the Bright Angel trail.

Thomas returned to Williams, 63 miles distant from the canyon, and on the following morning, Tuesday, hopped off about 8 a. m. Climbing to an altitude of 1000 ft. he lost no time in pointing toward the big gulch, laying his course over the railroad.

He continued at this altitude until he reached a point about eighteen or twenty miles away. Here, because of the thick shrubbery and trees below, which extend right up to the canyon and make it impossible to land without a crash, he rose to an altitude of 2000 ft., altitude being necessary to permit him to make a long glide back over this bad stretch in case the motor should fail.

ARMY AND NAVY AIR NEWS

Air Service

Night Flying from McCook Field—Night flying in the vicinity of Dayton, Ohio, has become almost as commonplace as day flying. Lieutenants L. D. Bruner and H. R. Harris, in charge of night flying, have been carrying on some rather intensive experimental work. The airplane used for this purpose is a remodeled DH4B, fully fitted out with pyrotechnics, night flying and emergency equipment. The testing and development of this equipment is of prime importance.

A group of Ordnance officers who came to witness a demonstration of pyrotechnics were recent visitors at the field. One of the problems in this connection is reducing the size of the parachute flare, in order to avoid danger where it falls, without sacrificing the lighting qualities. This is the brilliant flare used for picking out landing fields and for military observation. The landing light mounted on this airplane is a 100-ampere, 12 Watt lamp, operated by the same generator used for ignition and starting. It is planned to streamline the body of this lamp, in order to reduce the resistance to the wing tip. A new non-glow manifold has been designed and is used on this airplane, which cuts out the illumination from the exhaust.

A representative of the Lawrence Sperry Aircraft Corporation recently visited McCook Field, Dayton, Ohio, for the purpose of demonstrating in connection with night flying a new truck and searchlight combination known as the Sperry Duplex Truck. The purpose of this light is to serve as a beacon to mark landing fields for night flying airplanes. The light, which is of high intensity (three hundred million candle power), with a reflector measuring 36 inches in diameter, is the same type as that used on battleships at sea, but this is its first adoption for land purposes. By its radiation a landing field should be located from 75 to 100 miles away. The engine of the truck performs double duty, serving as power for the truck when in motion and for the searchlight when the truck is still.

* * *

To Prospective Flying Cadets—At Fort Omaha, Neb., recently, an army examining board was in session to examine candidates for appointment as flying cadets. Only 12 candidates reported to the board out of 19 who made application, and of these 12 only 4 passed the physical examination. Most of those who failed had physical defects which could have been picked up by any physician. Candidates presented themselves from places as far distant as Colorado. Had these candidates prior to making their trip taken the precaution to submit to a preliminary examination by their home physician they would have been found disqualified and would have saved the time and considerable expense which their trip entailed.

* * *

Preparing for Pulitzer Race—Selfridge Field, Mt. Clemens, Mich., is to be the scene of the next Pulitzer Race, to be held on Oct. 12, 13 and 14. The officers of the 1st Group (Pursuit) are preparing for an attendance of about 100,000 people, and are of the opinion that the event will undoubtedly surpass anything that has ever been done hitherto in races.

* * *

Mapping Middle West Air Routes—During the early part of July Army pilots from Chanute Field have been engaged in aerial mapping work over the States of Illinois, Iowa, Wisconsin and Michigan. The route from Rantoul, Ill., to Chicago, to Minneapolis, to Iowa City, to Rantoul was mapped by First Lieuts. F. A. Lundell and H. H. Carr.

A New School Group in the Air Service—Orders have been issued creating a new group in the organizations of the Air Service, to be known as the 10th Group (School), to be located at Kelly Field, San Antonio, Texas, and to consist of the following organizations:

39th Squadron (School)		Pursuit
40th	"	Bombardment
41st	"	Attack
42nd	"	Observation
43rd	"	Service
13th Air Park		
22nd Photo Section		
10th Group Headquarters Detachment		

Major John N. Reynolds, Air Service, will be in command of this new Group, which is to form the Advanced Training School of the Air Service. In its organization, it is contemplated that each of the present tactical groups of the Air Service shall furnish the nucleus of the new squadron which is to carry on its specialized work in the school. With this in view, the 2nd Group (Bombardment), which has been transferred to Langley Field, Va., has left some 14 officers and 100 enlisted men at Kelly Field to form the nucleus of the 40th Squadron. The 1st Group (Pursuit), formerly at Ellington Field and lately transferred to Selfridge Field, Mt. Clemens, Mich., is transferring some 10 officers and 100 enlisted men to form the nucleus of the new 39th Squadron. The 3rd Group (Attack), and 250 enlistrd men are being transferred from Post Field, Fort Sill, Okla., to form the nucleus of the new 42nd Squadron, the 13th Air Park and the 22nd Photo Section. About 100 enlisted men are being transferred from the Lighter-than-Air branch (Brooks Field) to form the nucleus of the 43rd Squadron.

When the School Group is completed, it is contemplated that the four different courses, which are now being given at three different stations, will be coordinated and fitted together in order that they may be given at one station. Pilots who graduate from this school will have good general knowledge of all tactical branches of the Air Service, as well as a very thorough knowledge of their own special branch.

The 40th Squadron is already organized and functioning. The others will be organized as rapidly as troops being transferred reach Kelly Field.

* * *

39th Aero Squadron Organized—The new 39th Aero Squadron, consisting of 100 enlisted men and 12 officers, was organized at Ellington Field, Houston, Texas, on June 27th last. The 100 enlisted men were formerly members of the 1st Group (Pursuit) at that station, these men volunteering to come to Kelly Field to start organizing the new advanced training school. The majority of these men are volunteers from the famous 94th Squadron (Hat in the Ring), which squadron ever since the World War has maintained its reputation throughout the Air Service.

Captain Bancom, now Commanding Officer of the squadron, also late Commanding Officer of the 94th, will with the cooperation of these men and officers now in his command, attempt to make the 39th equal to the reputation of the noteworthy 94th Squadron, and try to make the 10th Group one that will be prominent and noteworthy as the 1st Group (Pursuit).

At the present time, due to the organization just starting, operations have not begun. Every member of the new Group is doing his utmost getting things together for a big start. They are putting their hearts in their work to see that this new squadron and group become successful.

Army Orders—Maj. Gerald C. Brant, A. S., and Maj. Jacob W. S. Wnest, A. S., who graduated from the General Staff School in 1922, have been placed on the General Staff Corps eligible list.

Capt. Benjamin F. Giles, A. S., relieved from duty at Brooks Field, San Antonio, Tex., is directed to report to the station hospital, Fort Sam Houston, Tex., for treatment.

Capt. Arthur R. Brooks, A. S., relieved from temporary duty office of the Chief of Air Service, is directed to report to the Walter Reed General Hospital, Takoma Park, D. C., for treatment.

The name of Maj. Frank M. Andrews, A. S., has been placed on the detached officers' list.

First Lieut. Ulysses G. Jones, A. S., relieved from duty at the Aviation general supply depot, Morrison, Va., is detailed to Langley Field, Hampton, Va.

First Lieut. Russell M. Greenslade, A. S., relieved from duty at Kelly Field, San Antonio, Tex., is detailed for duty and pilot training at the Air Service Primary Flying School, Brooks Field, San Antonio, Tex.

Maj. Harvey B. S. Burwell, A. S., on leave of absence is directed to report to the Chief of Air Service for duty.

First Lieut. Oliver A. Gottschalk, A. S., is retired from active service on account of disability incurred in line of duty.

Maj. Earl L. Canady, A. S., relieved from duty at Langley Field is directed to report to the Walter Reed General Hospital for treatment.

Second Lieut. Hilbert Milton Wittkop, A. S., 318 East Washington Street, Greenville, Mich., is directed to proceed to Selfridge Field, Mt. Clemens, Mich., for physical re-examination.

The following Air Service Cadets have been commissioned second lieutenants: (With rank from June 13, 1922) Edmund Clayton Lyneh, Alfred August Kessler, Jr., Paschel Neilson Strong, Jr., Mervin Eugene Gross, Francis Borgia Kane, Daniel Allen Terry, William Stevens Lawton, Richard Wilson Johnson, Benjamin Wiley Chidlaw, Howard Gillespie Davidson, Fred James Woods, Kenneth Francis Pughe, Orval Ray Cooke, James Wrathall Spry, Frederick William Hein. (With rank from June 14, 1922) Landon Carter Catlett, Jr., Gilbert Hayden, Hilbert Milton Wittkop, Townsend Griffis.

* * *

Death Notices—The following death notices of officers of the Air Service are announced by the Adjutant General's Office:

SAMUEL M. LUNT

Born in Va., June 4, 1895. Appointed from Pa. Pvt. 1/c Av. Sec. Sig. E.R.C. Aug. 3, 1917; To May 22, 1918, 1st Lt. A.S. U.S.A. May 13, 1918, Accepted May 23, 1918, Vacated Sept. 6, 1920, 1st Lt. A.S., July 1, 1920; Accepted Sept. 6, 1920, Graduate, A.S. Communications School, 1921.

Service—On duty with 2nd Avia. Instruction Center, A.E.F. France from May 23, 1918 to July 1918, with 96th Aero Squad. AEF France, to Dec. 1918 (sick in B.H. 18 AEF, France from Sept. 27, to Oct. 19, 1918), with Air Serv. Prod. Center 2, AEF, France from Dec. 8, 1918 to Feb. 10, 1919; enroute to U.S. to March 3, 1919, Garden City, L.I. N.Y. from March 5, to 27, 1919; at Avia. Gen. Supply Depot, Middletown, Pa. from March 27, 1919 to May 8, 1920 (sick Nov. 6 to 12, 1919—temporarily at Inland Warehouse, Phila., Pa. from April 6 to 11, 1920), on duty at Post Field, Ft. Sill, Okla. from May 12, to July 18, 1920, as a student at Air Serv. Communications School and from July 19, 1920 to March 21, 1921 with 135th Obs. Squad.; Student Officer, A.S. Pilot School, Carlstrom Field, Fla. from March 25 to Aug. 1921 on leave of absence Aug. 5 to Sept. 4, 1921, Kelly Field, Tex. Sept. 4, 1921 to March 1, 1922, with 94th and 95th Aero Squad. Ellington Field, Tex. to June 26, 1922, at Advanced Flying School, Kelly Field, Tex. from June 28 to Aug. 1, 1922, killed at 8:30 a. m. Aug. 1, 1922 in airplane accident at Kelly Field, Tex.

LOUIS P. MORIARTY

Born in New York, Sept. 12, 1894. Appointed from New York Pvt. 26th Co. 8th C.A.C., N.Y.N.G., July 10, 1917, to Aug. 3, 1917, Pvt. 1 Cl. Av. Sec. Sig. E.R.C., Aug. 20, 1917, to Feb. 2, 1918; 2nd Lt. Av. Sec. Sig. O.R.C., Feb. 2, 1918, Accepted Feb. 2, 1918; Vacated Sept. 14, 1920; 2nd Lt. A.S. July 1, 1920, Accepted Sept. 14, 1920; 1st Lt. July 1, 1920. B.S. Columbia University, 1917; Grad. Mass. Inst. of Technology, Air Service School, 1921.

Service—On duty at Rockwell Field, San Diego, Cal., from Feb. 2, to 17, 1918, enroute to and on duty in France, sailing from Hoboken, N. J., March 4, 1918; returned to the U.S. Feb. 13, 1919; was wounded in combat with enemy aircraft about Sept. 27, 1918, shown as in Conv. Hosp. A.E.F., with G.S. wound in right leg, Nov. 30, 1918, to date not given, on duty at Garden City, L. I., Feb. 14, 1919, to Mar. 12, 1919; sick in military hospital, Cooperstown, N. Y., Mar. 12 to May 5, 1919, duty at McCook Field, Dayton, Ohio, to Sept. 23, 1920, taking course at Mass. Inst. of Technology, Cambridge, Mass., to July, 1921, on duty at McCook Field, Dayton, Ohio, to date of death. He was killed Aug. 14, 1922, result of airplane crash at Fairfield Air Intermediate Depot, Fairfield, Ohio.

* * *

Change in Status—14th Aero Squadron reported demobilized in Changes No. 12, in the June Army List and Directory, will be carried hereafter as an Inactive Unit, with the 49th Aero Squadron as the Active Associate.

Naval Aviation

Bravery Commended—The Navy Department has addressed a letter of commendation to Claude George Alexander, Chief Radioman, U.S.N., attached to the U.S.S. Aroostook for his exceptional bravery July 6, 1922, when DH4B airplane No. S-316 on which he was a passenger crashed in a field about two and one-half miles north of Encinitas, Calif. The plane was on an authorized cross-country flight, Ensign Ralph R. Auerswald, U.S. Navy, Pilot.

Almost immediately after the airplane crashed, the gas tank exploded and the plane burst into flames. When the plane struck the ground Alexander crawled out of his seat, released Ensign Auerswald's safety belt and lifted him bodily part way out of his seat. At this instant the explosion occurred, and Alexander was thrown to the ground clear of the plane. When he regained his feet he saw Ensign Auerswald pitch, head first, out of the plane to the ground. He then picked up Ensign Auerswald and carried him to a place of safety away from the burning plane.

Alexander re-enlisted Oct. 7, 1919. Next of kin, wife, Cornua Elizabeth Alexander, Seward, Alaska.

* * *

Naval Orders—Lieut. John E. Ostrander, det. Torpedo and Bombing Plane Squadron One, to postgraduate course ordnance Naval Academy, Annapolis, Md.

Lieut. Bernard P. Donnelly, det. U.S.S. Camden; to Aircraft Squadrons Battle Fleet.

Coming Aeronautical Events

AMERICAN

Oct. 7 — Detroit Aerial Water Derby, Detroit. (Curtiss Marine Flying Trophy Competition.)

Oct. 12-14 — Detroit Aerial Derby, Detroit. (Pulitzer Trophy Race.)

FOREIGN

September—Grand Prize of Italy. (International Airplane Competition.) Milan, Italy

Sept. 22 — Coupe Henri Deutsch de la Meurthe. (Airplane speed race.) France.
American elimination trials, if required, to be held about Aug. 15, at Mitchel Field, L. I.

October — International Parachute Competition. Rome, Italy.

Foreign News

Germany—The invention of a wing-strain indicator by Klemperer, of Berlin, should prove of interest to the airplane industry. This instrument works on the theory of mass and weight pressure. When the plane is at equilibrium the indicator points to "1," and when the component forces are increased the indicator moves correspondingly, warning the pilot that there is too great a pressure on the wings. This device will be very useful when the pilot takes sharp curves, ascension curves, or when pulling up for a dive, and a great number of accidents should be prevented through its use.—*Commerce Reports.*

The German Minister of Posts has given his approval to the opening of a postal air service between Geneva, Nuremberg, Berlin, Konigsberg and Moscow. From July 1, the Moscow mail will leave Geneva twice weekly, on Wednesdays and Saturdays, by the ordinary Geneva-Nuremberg airplane. The mail will start from Geneva at 7 a. m. and will arrive at Berlin at 3.55 p. m. there it will be carried by the evening train to Konigsberg, from where it will start next morning at 8.30, and arrive at 7.15 p. m. at Moscow. An extraordinary tax of 25 centimes per twenty grammes (3½d. per oz.) will be charged on letters sent by this mail. Negotiations are being carried on with a view to establishing new air services linking Nuremberg with Copenhagen, Prague, Warsaw and Budapest.

* * *

Belgium—The first international air reliability trial ever held has just been completed at Brussels, and was won by a Handley-Page machine fitted with two Rolls-Royce engines. It was an open competition, but the Handley-Page was the only British competitor. Eight foreign machines, including a Farman Goliath, a Spad and a Breguet participated. The course was over two circuits near Brussels, each circuit being 25 miles. The pilot had to state exactly how long he would take over each circuit, and marks were taken off for the amount of time by which he increased or was short of his declared time. Marks were also given for speed and climb and weight carrying.

The Handley-Page pilot estimated the time exactly for the first circuit, and was 12-1/5 seconds too quick in the second one. The machine scored 100 per cent. marks for take off, speed, climb, and weight-carrying. The first prize was £200, and there were numerous other awards and cups given by various aero clubs.—London *Evening News*.

* * *

France—The all-metal Breguet "Leviathan," the fuselage of which was exhibited at the last Paris Aero Show, has been flown. Pilot by M. Thierry, the machine first made a straight climb of 1,000 feet, and the pilot then made a complete circuit of the Villacoublay airdrome. No sharp turns were attempted, as the machine is a large one, and it was thought wiser to proceed slowly with the tests. The "Leviathan," on which the late Lieut. Henry Roget was to have attempted a flight from Dakar to Pernambuco, is fitted with one of the Breguet-Bugatti quadruple engines, in which two groups of double vertical engines drive a common tractor screw via automatic clutches.—*Flight*

* * *

Russia—The aerial mail service initiated on May 6 from Hamburg via Stettin to Danzig, Konigsberg, Kovno, Riga, and Moscow, has made a marked reduction in the time required for delivery of mails between Germany and Russia, according to recent dispatches from Consul Huddle, Hamburg. The saving amounts to 24 hours in mail for delivery to Kovno, and 36 hours for mails to Riga. In addition there is a saving of 5 hr. time in the Danzig and Konigsberg mails.

A daily service from Hamburg to Kovno is maintained, and from Kovno to Riga the trips of the mail planes are on Tuesdays, Thursdays, and Saturdays. From Konigsberg the planes leave on Thursdays and Sundays to Moscow, the flying time to Moscow being in the neighborhood of 37 hr.

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WASHINGTON, Aug. 9.—Caught in a gale in a cloud bank a thousand feet deep, Captain H. C. Mustin, Assistant Chief of the Bureau of Naval Aeronautics and one of the most experienced pilots in the navy, made a successful test of an instrument which has recently been made standard equipment on all types of naval planes.

The gyroscopic turn indicator is an instrument designed to keep the pilot informed of the relative position of the plane when flying in fogs or cloud banks. By means of it he can keep a true course and come safely through without it he may fly in circles or even upside down without appreciating his peril. A high wind with heavy cloud banks and "bumpy" air combined to give Captain Mustin a practical demonstration of the value of the turn indicator. By means of it he was enable to manoeuvre his plane through the clouds without deviating from the course.

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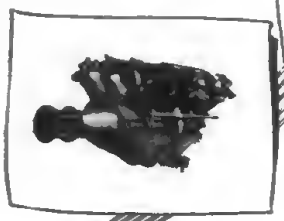

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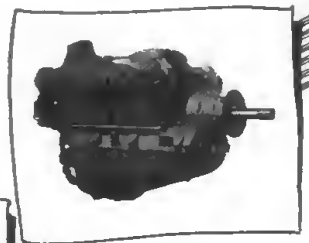
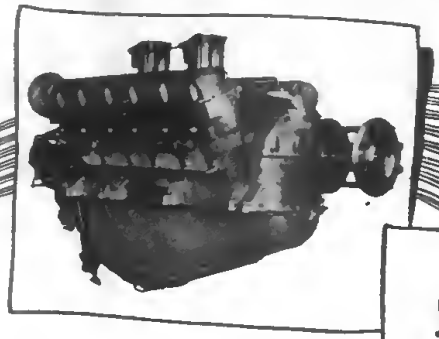
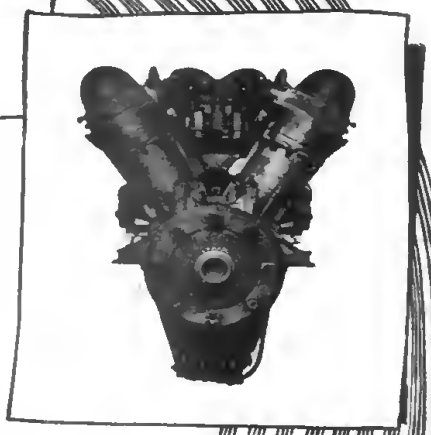


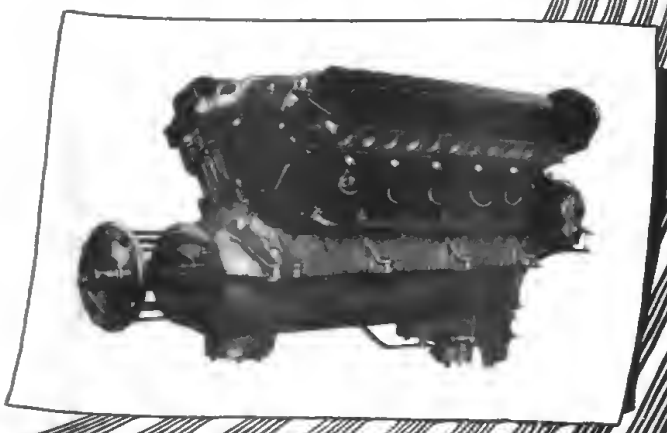
During 1918 The K Twelve of 395 B.H.P. 1.77 lbs. per H.P. World's record for altitude unsupercharged.



During 1920 The C Twelve of 430 B.H.P. 1.64 lbs. per H.P. Second in 1921 Pulitzer Trophy Race.



During 1921 The CD Twelve of 390 B.H.P. 1.81 lbs. per H.P. First place in 1921 Pulitzer Trophy Race.



and NOW The D Twelve of 400 B.H.P. 1.68 lbs. per H.P. The latest and best pursuit engine. The result of many years of engineering endeavor to produce the ideal combat power plant.

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